

Name: SOLUTION

Answer the questions below. Be clear and concise in your answer, writing in complete sentences and providing examples for support as appropriate.

General Notes:

Performance was good on the quiz. I was very lenient in the grading this time. One request I have is that you (a) write in complete sentences and (b) be concise. Three sentences should be plenty to answer the questions ... no memory dumps, please! (This is actually an important software engineering skill - learning how to communicate complex things in the simplest possible way.)

If you have any further questions, don't hesitate to contact me or come see me during office hours. The structure of this quiz seemed reasonable - one "declarative" question that basically asks you to recall or summarize some information that we've covered, and a second question that asks you to think about the information from what may be a different angle - so future quizzes will probably be similar.

1. (5 pts.) One shortfall of the waterfall model of software development is the model's resistance to changes in customer requirements. Name two ways that alternative models of software development deal with requirements changes more effectively.

The main thing I was looking for here was a couple of features of evolutionary models. I didn't count off if you simply listed a couple of evolutionary models, but I would say that it is much more important to pick up on the interesting/useful features of the models than to remember the exact name and description of a model (although it's good to remember names to have a reference point for learning about the models, of course). Common answers included iteration, incorporation of customer feedback, using prototypes, and releasing in increments. Favorite answer: "Add more arrows" :)

2. (5 pts.) We saw in a class exercise that estimating the cost of software, especially at the beginning of a project, is difficult. Given a waterfall approach vs. an evolutionary alternative, which of the two would lead to more accurate cost estimation? Justify your answer.

There is no "right answer" to this one, so the points basically depended on providing some kind of support for your claim. Obviously, the choice of development model depends on the type of product you are developing. However, you will find in industry that most customers expect your bids to be broken into stages similar to the waterfall. It's possible to adapt this to an "evolving bid", but customers are sometimes reluctant to enter in to this kind of arrangement, because it can lead to a never-ending project. This problem is sometimes referred to as requirements creep or scope creep, and takes project managers years to perfect: How do we predict (then control) the cost of development when using an evolutionary process without making the customer feel like we're spending too much? In my experience, the rough initial cost estimate is developed and presented in terms of a rigid model, then the organization uses some other, more flexible model and corresponding cost estimator during the actual development.

Waterfall:

- PROS: Rigid phases, each can have a cost and specific amount of work
- CONS: Bad final product means repeating entire process (expensive), and wasted time

Evolutionary:

- PROS: Lower chance of bad final product (and repeated process); Iterations, when needed, are shorter/over fewer phases
- CONS: No concrete stages, no predefined amount of work per iteration

Favorite Answers (excerpts):

- PRO-Waterfall: “The rigid nature of the waterfall model allows for more accurate initial estimation at the cost of flexibility during development.”
- PRO-Evolutionary: “The waterfall model would create a product that may not fall into what the customer wants, and therefore you may need to go back through the whole development process, spending even more money.” “An evolutionary alternative would lead to a more accurate cost estimation if the estimate was also able to be evolutionary.”
- Other: “A waterfall approach would lead to a more accurate initial estimate .... An evolutionary model will give a better estimate during the project ....”